theCOB
The Magazine of the Maize Association of Australia
Winter 2021

MAA Chair's Report - Stephen Wilson

The 2020/21 summer cropping season has certainly been another challenge. The extended dry period and lack of stored moisture in the northern cropping regions meant growers were not able to sow their normal area of corn. Those that did plant suffered from little to no follow up rain, coupled with extremely high temperatures during the flowering period. The expected La Nina (normally associated with a wetter than average summer) was a major disappointment in the traditional cropping zones.

Overall, plantings were well down in the northern regions and those that did plant had to contend with Fall Army Worm (FAW) incursions. FAW has now been detected from Kununurra in Australia's north to Wynyard on the North central coast of Tasmania. The impact of the FAW did vary across the growing regions, with the impact more severe in some of the northern cropping areas, and especially on the later plantings. Many growers are concerned about next season, and this is likely to impact on spring planting plans. Research by various Government and private organisations has identified some spray and cropping options that will need further research this coming season.

Some growers have raised the option of genetically modified (GM) corn as an aid to control the FAW. As you would be aware, the MAA has always adopted the position of keeping the Australian corn market GM-free. Our end-users continue to tell us that they do not want GM traits in their food products (breakfast cereals, snackfoods etc). In addition, we continue to develop the potential to export non-GM corn, and while this market has not developed as much as we would all like to see, we do not want to jeopardise our clean, green image.

The La Nina weather system, albeit a weak one, did eventually arrive and the southern zones were mostly affected from this with a cooler milder summer. Yields of both grain and silage have generally been slightly above average, with some southern growers reporting a 60% reduction in water usage and up to a 10% increase in yields. However, in both the northern and southern zones there are still crops to be harvested, with crops in SE Queensland planted on the January rain still sitting in the field and grain moisture around 20% at the time of writing.

The other challenging issue has been a major mice plague across the eastern states, damaging crops and reducing yields. Hopefully mice numbers will decrease with the cold and wet winter that many areas are currently experiencing.

Silage continues to be an important component of the maize industry. With the cooler, milder conditions in the southern regions, silage harvest was later than normal. Yields averaged 23-25 tDM/ha, with top end yields being up to 35 tDM/ha.

Looking ahead to next season, it looks like it will be another challenging year. In the northern cropping zones, there is good sub-soil moisture which may facilitate an early plant. However, lack of irrigation water and the major concern around FAW will impact some grower's plans.

In the southern irrigated cropping zones, increased water availability at more realistic prices will give growers plenty of options. There may be increased demand for processing corn to meet the requirements of the northern end-users. There is expected to be strong interest in the silage sector of the market again for the 2021/22 season.

Please add the Australian Summer Grains Conference 2022 – July 11-14 2022 – to your diary. The MAA is a key component of the Conference, and both myself and Johannes Roellgen are on the organising committee. We are currently organising the keynote speakers, with major promotional activities to commence soon afterwards. The Conference is planned to be along the traditional lines of face-to-face interaction, but will also have the opportunity to participate on-line.

Finally, the MAA is here to represent all sectors of the industry. Financially we are in a very strong position, and we would like to utilize a portion of these funds to help grow and promote our industry. If you have any ideas, whether they be research to grow better crops or marketing to help sell the grain, please contact one of the Executive Members.

All the best for the 2021/22 season.

Steve Wilson
Chair, Maize Association of Australia

In this issue

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Contributions welcome. Manuscripts and photographs are handled with care; return of unsolicited material is not guaranteed. Copy preferred by email or on disc in text-only format.

Growing Maize in Northern Victoria and Southern NSW

By Ian Hamono (Farmer Northern Vic), Fraser Pogue (Farmer Northern Vic), John Auer (HSR Seeds), Jason Scott (GenTech Seeds)

Interest in growing maize for grain and silage in the southern region has recently increased. This is due to a number of factors including; water becoming more available and affordable, cotton crops pushing further south, QLD drought continues, and the dairy industry having a strong outlook.

The less extreme climate in Northern Vic and Sothern NSW with, cool nights and long days have resulted in the highest yields in Australian maize.

If you are considering growing maize for the first time, or have only recently entered the industry then it is important to consider a number of issues. The most important issue is a knowledge of the market that you wish to access and will on farm storage be required. This will determine which variety you are best to plant, and then also help determine if drying of the grain is it likely to be required following harvest.

There are three main markets - feed, grit and specialities such as popcorn. Maize grain for feed is the largest market and has been sort after as a stockfeed option across all livestock industries, although the erratic supply between years has limited its uptake in some sectors. Regular contracts are available for supplying grit into food processing. Grit and specialities have tight specifications and should be avoided unless growers have maize cropping experience.

If growing grit maize, it is important to ensure that the variety you wish to grow is suited to the particular processing customer. For example, corn chip and cornflake manufacturers may require a grain with a hard, flinty endosperm, whereas corn flour processors may require a soft, floury grain.

Traditionally industry has treated maize as a full season summer crop, but with new genetics and alternate planting methods, stockfeed maize can now be planted from October to Mid-January.

Although food processing maize has only full season variety options at this point.

Maize for grain is being grown as far south as Bendigo and Horsham (dryland low input), with successful trials under way in Tasmania. Planting is safe once soils reach 10 degrees C and rising. Inputs and thus cost of production can be adjusted to fit anticipated yield targets. Planting time can be determined based on what crop maize is following (pasture, cereals, canola etc) and when that ground is available for planting.

Long CRM (Comparative Relative Maturity) varieties provide the highest yields, with yields of over 20 tonne/ha possible. But to reach these yields they need the full summer season to do this. Short CRM varieties provide an additional opportunity, enabling growers to take advantage of longer winter crops and shorter summer windows.

Increased Canola cropping has meant there is significant ground being late planted. New short season varieties are suitable to plant following canola harvest, with significant ground now being late plantings. In addition, shorter CRM (Cumulative Relative Maturity) varieties also use less water.

Shorter season/lower CRM varieties have increased the length of the maize planting window, without pushing harvest out into winter, unless there is an early autumn break. CRM is an indicator only of how long a variety takes to mature and there are significant differences in speed of dry-down between similar CRM varieties. It's important to establish when you want to harvest a crop, what are the likely days to harvest for a given variety and what crop is planned to follow in rotation.

Crop yield will however vary depending upon when crops, even of the same CRM are planted. For example, last summer HSR Obelix 92 CRM planted in mid December in Katunga yielded 13.8 tonnes and was harvested in early April. HSR Asterix 85 CRM planted in Cowra in mid January yielded 10.8 tonnes harvested in late May.

Full season varieties at 114 to 117 CRM are suitable for planting in October through to early-November. These varieties do produce crops with a stronger stalk strength and tall stature, which means it has a much lower risk going into wet Autumns or early winters. It can in fact over winter in the paddock if the rain delays harvest or drying is not possible.

In general terms, in northern Victoria a hybrid of 113 CRM or less should be able to be paddock dried 80% of the time. With hybrids with a longer CRM than this sowing time becomes critical, as late planting will result in drying post harvest occurring around 60% of the time. Planting these varieties in late October/early November will most likely result in the grain requiring drying after harvest. Many experienced growers in the area would recommend avoiding late planting of full

season varieties as it is best to avoid the need to dry the grain, and aim to have the crop harvested in time to plant a subsequent crop.

Generally, the stalk is not as strong with some short season varieties. If the crop may need to be overwintered then mid-season varieties which are more "robust" should be planted.

Maize planted from mid November onwards may well need some drying, the 20/21 summer pushed many maize crops towards a late harvest with the grain then required drying. With a strong stalk and plant structure, maize is well adapted to handle wet cool harvest periods. The concern in this case however is to try and stay off wet ground with heavy machinery. Compaction or damage to soil structure takes several seasons to fix, so it much safer to choose a shorter season variety than to push for top yield and get caught harvesting in wet conditions. To maximise yield and minimise the chance of requiring drying and possible over wintering it is best to plant mid October, using mid-season varieties. Later plantings use short season varieties.

Drying can result in a significant cost, with farmers being required to factor in the cost of freight to and from a dryer, along with the actual cost of drying. The cost of drying alone could be in the vicinity of $20/tonne. If drying is required ideally you should aim to sell the grain straight from the dryer to minimise freight costs.

When selecting your variety ensure you select one of the top performing varieties from seed company trials in your region. Your

variety selection may then be further limited depending upon your desired planting time, and prior crop history. In Northern Victoria/ Southern NSW grit varieties are limited by maturity times. The industry accepted grit varieties are risky unless the grower is prepared to dry the grain following harvest or over-winter. Overwintering a crop is un-economic as it precludes the subsequent winter crop.

Some growers in Northern Victoria budget to dry 50% of crop each year as typically later plantings won't dry down because of cooler autumn ambient temperatures. Many growers in the area harvest at 18% moisture as a strategic measure to fit with Autumn planting of winter crops and double cropping corn fields. Growing maize for grain is extremely risky unless growers have drying and storage capability as you are selling into a biased "buyer's market".

An increased use of minimum and strip tilling planting methods has also made maize easier to grow and faster to establish in crop rotations. Experienced growers would not recommend planting a crop after a wheat/ barley harvest, unless it was a short season CRM variety and if the aim was to harvest maize grain then drying would also be required following harvest. Growers have been successful planting maize following cutting a crop for hay, or after an early harvest of faba beans and canola. If maize is planted following a cereal hay or grain crop additional nitrogen will be required to be applied either at planting or during the season based on tissue testing.

Maize is a highly versatile and adaptable summer crop. Risk can be spread by growing a number of different varieties, with different CRM's.

All the major seed companies and agronomists can provide excellent information relating to variety selection for your region, agronomy, and crop nutrition etc. Weed control is crucial to achieving high yields, and insects during the season must also be monitored.

Finally, maize is an expensive crop to grow. Seek knowledge, use experienced agronomist or speak to seed suppliers, don't 'cut corners', nutrition is critical to achieving yield. Weeds 'kill' yield. Maize doesn't like wet feet – water on, water off. Always pre-water flood irrigated fields. Get plants to knee high before flood irrigating. Also carefully monitor insect pests, i.e. Heliothis and Two Spotted Mites.

For more information:

SLTEC Maize Nutritional Guide

sltec.com.au/sltec/brochures/SLTEC_MaizeNutritionalGuide.pdf

Pioneer Seeds

https://www.pioneerseeds.com.au/our-products/corn

Pacific Seeds

https://www.pacificseeds.com.au/agronomy-hub/#field-corn

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The Role of Fibre in Silage and Animal Nutrition

By Ben Morgensen, Marketing & Communications Coordinator, Lallemand Animal Nutrition

Increasing intakes of high-quality silage are crucial to driving on-farm profitability, but to achieve this, producers must understand the role of fibre. Fibre plays a vital function in milk production and the utilisation of silages, influencing rumen function and regulating total dry matter intakes.

Maize crop growers and silage makers should plan to produce forages with high levels of digestible fibre. When silages are analysed, the fibre fraction is usually described as Neutral Detergent Fibre (NDF) and lignin. Some more modern analyses report digestible NDF (NDFd), which is a better indicator of the digestibility and therefore the value of the fibre. The analysis may also include ADF (Acid Detergent Fibre) which is a measurement of the indigestible fibre found in silage, as the value increases NDFd will decrease as will the energy content of the silage.

Balancing Fibre

Fibre digestibility is crucial as it affects the rate of fermentation in the rumen, the rate of rumen passage and ultimately dry matter intakes. More digestible fibre will be fermented faster in the rumen, stimulating higher intakes. Indigestible fibre sits in the rumen and can depress appetite. Just as with any feed ration, a balance is required. Although fibre needs to maximise NDFd, it needs to be balanced with levels of undigested fibre to increase dry matter intakes and feed efficiency. For example, young grazed grass is very high in NDFd and contains little undigested fibre so passes through the rumen quickly, increasing dry matter intakes. At the other extreme, high straw diets for dry cows are more lignified and contain a much higher level of undigested NDF, passing more slowly through the rumen and reducing dry matter intakes but maintaining a higher rumen fill.

Silage

Another factor to take into account to maximise rumen health is the effectiveness of that fibre at forming a rumen mat to stimulate rumination. Optimising rumination is essential to maintain high production levels and a healthy rumen environment. Physically effective Neutral Detergent Fibre (peNDF) is the proportion of fibre that stimulates cudding and the formation of a functional rumen mat. It can be measured in most diets by sieving with a Penn State separator.

Where lignin is high in a silage, the rumen will need to be supplemented with the optimum level of rapidly fermentable energy sources. These can increase the risk of acidosis, so need to be balanced carefully.

By understanding fibre better, producers maximise the contribution from silage.

Maize silage plays an important role in animal nutrition. The production of high-quality maize silages which are well persevered coupled with high levels of digestible fibre are key components to cost effective, healthy and hygienic animal production systems.

Lallemand Animal Nutrition is Australia's leading supplier of silage technology and technical support when it comes to developing and understanding forage based feeding systems, silage inoculants, sealing systems and associated measuring and management tools in this field. For more information or assistance with your silage needs, please contact Lallemand Animal Nutrition on (07) 5451 0125.

How well do you know your bacteria? by Jason Scott, Silage Specialist, National Microbial Lead, Pioneer® Seeds in Australia

Silage inoculants are an investment, not an expense, and the benefits to using the best silage inoculants on the market are considerable and wide ranging. Silage inoculants are important to ensure the retention of pasture and forage crop nutrients through the ensiling process of crops such as corn and sorghum.

There are a variety of naturally occurring bacteria that can be present in silage which produce a range of fermentation acids. However, a lactic acid fermentation is the most desirable as it loses minimal energy during the fermentation process and produces palatable, high feed value silage.

However, it can be difficult to know which is a good inoculant product and which one is less so. "This is simply because the product label lists just the same genus/species information such as *Lactobacillus buchneri*. However, a listing that does this, doesn't take into account the tremendous genetic differences between individual strains within a species".

The differences could be likened to the variances in cattle breeds. "While product labels may read similarly, there are differences in bacterial stains just like there are differences in the milk production potential of Friesian and Hereford cattle (both of which have the zoological classification *Bos Taurus*)".

So, when you are buying an inoculant that doesn't identify the bacterial strain, you don't always know what you are getting.

Pioneer® Brand Products has been researching and identifying effective bacterial strains to be used in silage additives and inoculants since 1978 and has developed a wide-ranging portfolio of crop specific inoculants.

Pioneer commercialised the first proprietary inoculant containing *L. buchneri*, the main bacterial strain of choice to ensure silage pits remain cool and to prevent feed losses due to the growth of yeasts and moulds, in 2000.

Today, there are over 100 different inoculant products on the market worldwide. It would be a tremendous financial drain on any one company to test against every competitor in animal trials (the only true test) because can cost upwards of $30,000 - $60,000 per trial.

Pioneer has conducted extensive scientific animal performance silage trials previously, and they have great confidence in the results. Now, when Pioneer releases new products, we make comparisons against control silage (without inoculant) and their current best product.

"This gives us the opportunity to see the relative improvement in shrinkage, fermentation parameters (e.g. pH, ammonia nitrogen, volatile fatty acid (VFA) profiles) and animal performance against an untreated control. Hence gives us confidence in the bacteria strains we are using in our products.

Farmers are encouraged to make product comparisons by asking inoculant suppliers for their animal data against an untreated control so they can be confident they are comparing data properly, and to know that they are investing in a strain that will deliver the best quality silage possible.

"Many companies have no animal data, and often very little fermentation data as well, even against an untreated control, which then leaves farmers and contractors unclear about performance expectations for their investment in the inoculant they choose.

Quality silage inoculants will contain:

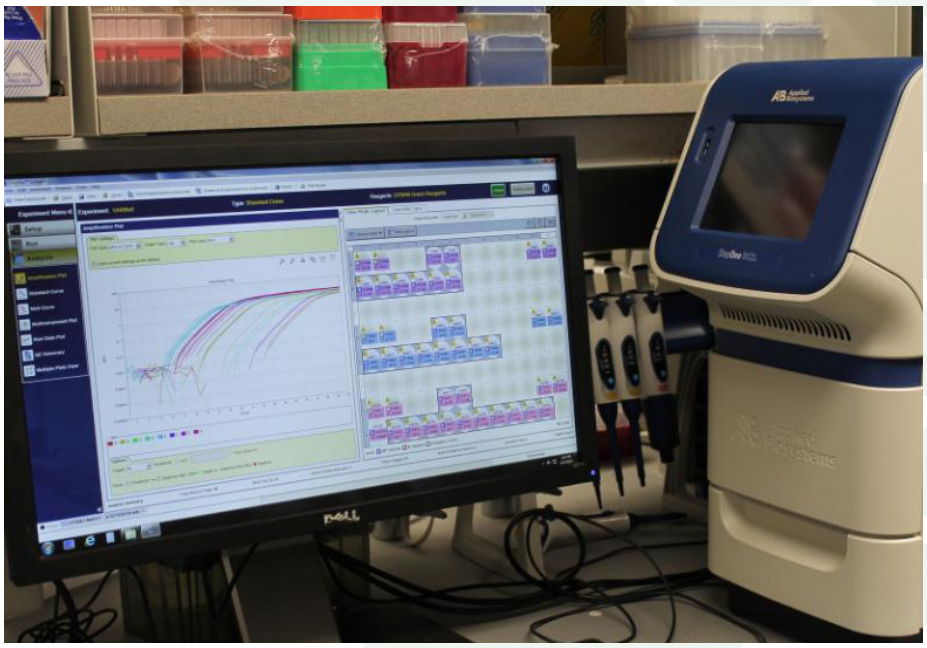
The right bacterial strains. The inoculant should contain strains that have been proven to improve silage quality.

The right numbers. The inoculant must contain live bacteria in the concentration that has been proven to give a positive result.

The right proportions. Most bacterial inoculants contain more than one strain. Some strains are more competitive and reproduce more quickly than others. Each strain must be present in the correct proportions to give the claimed performance advantage.

No contaminants. The inoculant must be produced under sterile conditions to ensure that other micro-organisms do not contaminate the inoculant.

Live bacteria. Live bacteria of the correct strains must be present in the right proportions right up to the time of application. While manufacturing quality control is critical, packaging is equally important.



Inoculant Research Computer

Pioneer has also supported the advancement in inoculant technology with the development of an application system designed and calibrated specifically for Pioneer® brand inoculant products.

The unique design of the Appli-Pro application system reduces water requirements and offers a high level of application precision and convenience. The Appli-Pro has been designed to work with all major brands of forage harvesting equipment, and allows the operator to use the cab-mounted control panel to turn the applicator on and off to precisely control the application rate.

More information, https://www.pioneerseeds.com.au/our-products/inoculant

Harvesting silage

Hybrid Stress tolerance and adaptability reduces risk in Dryland Maize by John Auer, HSR Seeds

When considering what maize variety to grow, many factors need to be taken into consideration. One of the most common questions from growers is the ability of a maize plant to handle stress.

A varieties stress tolerance comes in many forms and multiple traits. Careful consideration is placed on the ability of a hybrid, to establish quickly and uniformly, to produce good pollen flow, particularly in heat and the ability of a hybrid to produce viable silks and produce grain under variations of temperature.

HSR Amadeus IT is a good example of "stress adaptability" and has been widely grown in dryland limited moisture situations and environments that often experience heat and disease. Amadeus IT built a reputation to produce good yields and hold grain size in these environments. Its ability to hold large grain in tough seasons is recognised by grit corn processors as well, this significantly reduces rejection risk for growers.

New varieties like HSR Pegasus, takes the strong stress tolerance ability, and adds more yield. Over the last three years Pegasus has consistently yielded at HSR research hard dryland sites, and in full irrigated sites. Pegasus has always performed over 110% of the mean yield of that site, and in some locations up to 125%. It always performs in the top five hybrids, which includes commercially available hybrids. Risk management and bottom-line profit require adaption across a range of environments, in both tough dryland environments and fully irrigated high yielding situations.

Pegasus has ability to hold grain size under extreme temperature or moisture stress conditions. This is an incredibly important trait, particularly for a gritting and processing market, as it provides them with acceptable grain size and excellent starch extraction. Some key high yielding hybrids are unable to hold their grain size, or maintain hard starch levels when they fall under stress in the grain fill process. This often results in them not meeting the market requirements for the specialty grit and processing markets.

Pegasus holding grain size, under extreme stress

Pegasus is currently under evaluation with multiple grit and processing end users and to date has performed very well under their testing parameters. Pegasus is a 116 CRM hybrid, that offers excellent adaptability from Victoria to North Queensland and under high yielding irrigation production and dryland maize production regions.

It is an excellent silage variety, due to its high grain yield, its plant height and stover to grain ratio.

Stress adaptability reduces grower risk and increases bottom line profit. Pegasus is an excellent choice for maize producers looking for a tough all-round hybrid that can produce high grain and silage yields in both soft growing conditions and challenging dryland environments.

Quick Maturity Maize in Northern Australia by John Auer, HSR Seeds

Quick maturity maize hybrids can reduce risk, increase returns on available water and provide more cropping options. One thing is for sure, our seasons are extremely variable. This is an important factor when taking into consideration what variety and maturity of maize to plant and when.

Quicker hybrids have not displayed the higher yield potential of more full season hybrids. However, with wide spread hybrid trials and selection, that yield goal is closing. The new 105 CRM HSR Brutus has excellent stress tolerance, early growth, yield for maturity and plant height. Growers can experience rewarding yield results in grain and silage with the added bonus of the quicker maturity.

Quicker maturity is useful in many ways.

In an irrigated crop, it means less irrigation water. It increases opportunity for double cropping into unused soil moisture following the maize crop. This can be achieved through an early spring planted crop of a quicker maturing hybrid like Brutus, which can be harvested sooner than mid and full season varieties and then allowing a second summer crop to utilise any excess soil moisture and nutrition from the maize. This can result in a very good return per ha and megalitre over summer.

Research has shown that a short crop duration is an important attribute to combat water stress, so quicker maturing hybrids are better adapted to limited water supply or in areas where moisture stress is relatively high.

Quick hybrids provide risk spread on a spring plant that will flower and then fill grain in a "cooler" period rather than later in mid-summer when we are more prone to extreme heat. And on a mid-summer plant, it also offers good risk spread and protection from early frosts being up to 10 days and quicker than a mid-season hybrid to reach physiological maturity, which then can result to 30+ days earlier to grain harvest, due to the quicker dry down of the plant and grain.

Brutus 105 CRM, showing rapid cob dry down, with strong stay green

Brutus is exceptional at utilising its maturity, along with excellent stress tolerance, pollen production and viability, and ability to yield for its maturity to produce a viable successful maize crop, both in the north and the southern maize growing areas.

It's worth considering shorter maturity in risk management in dryland farming systems in the north, and in limited or supplementary irrigation situations where they can provide good yield and return on the available water.

WaterCan Profit By Prof. Matt Harrison

The Optimising Grains Initiative funded by GRDC is building an economic calculator to help grains growers maximise profitability of irrigation water. The economic calculator is called 'WaterCan Profit' has three parts:

Water Price app: As water price increases, how does the profitability of different irrigated crops compare? The water price app is relatively simple to use and is available here https://www.youtube.com/watch?v=e8F-jILuInA

Optimiser app: Given a fixed annual allocation of irrigation, what is the most profitable combination of crops to irrigate? This app accounts for farm size, crop yields and water use, soil type, seasonal climatic outlook and many other factors. The Optimiser app is available here https://www.youtube.com/watch?v=8q8ZI5NEC54

Investment app: allows contrasting of long-term investment decisions in alternative irrigation infrastructure (e.g. switching from border-check to pivot irrigation) and includes payback time and future cash flows accounting for initial capital investment and other costs. The Investment app is available here https://www.youtube.com/watch?v=nIlkbETmJCs

For questions or to obtain a free copy, please contact Assoc. Prof. Matt Harrison via email matthew.harrison@utas.edu.au or phone on 0437 655 149.

Organic Maize Crop a Yield Winner by David Coddington, Agronomist, Elders Narrandera.

An organic maize crop grown by Narrandera's Hewitt Cattle Australia last summer yielded 11.80 tonnes a hectare of grain even though mice took at least 2 t/ha. Part of its success was careful soil preparation and dedicated advice. Agronomist David Coddington discusses how the Hewitt team in conjunction with IRA's Neil Durning managed to tap the operation into a new and profitable market.

The Hewitt Cattle Australia and "Warilba" manager Ben Skerman primarily market organic prime lamb but they had been considering supplementary organic summer crops. The best option we decided was organic maize grown under pivot irrigation.

It made sense to grow a gritting hybrid so that marketing options were widened, and Ben could sell the grain for human consumption, use it himself or sell it as organic stockfeed.

We had access to bare untreated seed of the Pioneer Hybrid P1756, which was also favoured by other conventional maize growers within the MIA/CIA growing area. The 30ha selected for the maize had already been dressed with 10 tonnes/ha of composted poultry manure in autumn while sown to a barley silage crop. After deep ripping, another 15 tonne/ha of manure was ground spread.

The maize was sown on 15 October 2020 at 80,000 kernels a hectare into a well-prepared seed bed.

As the Maximerge XP planter, pulled out of the block, we had a 10 mm rain event that got the crop going nicely. The planter incorporated an organic liquid pop-up fertilizer from SLTEC called Quadshotat 20 litres a hecatre, along with an OCP's AzaMax organic insecticide, which is an isolate from the neem plant that discourages soil insects from feeding.

What a start to this crop's life.

It bounced out of the ground with that rain event, with every kernel that went in the ground coming up within five days, thanks to great soil temperatures and moisture.

The crop was inter-row cultivated a month later, on 20 November 2020. There was not much else we could do for the crop except water, water and more water. With a very mild summer and great flowering conditions, once we could see the grain set on the ears, we knew that this was going to be one out of the box for an organically grown maize crop.

The crop had been able to access nutrients from deep in the soil profile, which had previously supported only native pasture prior to the barley silage. This also helped it withstand pressure from rodents.

By the time we started to see a little colour in the grain, the mice came in so we did a bit of homework on what we could use organically to keep them at bay. We joked about stocking the field with two cats per hectare, but have you ever tried to herd 60 cats over 30 hectares?

Ultimately, our hands were tied, we could not do a thing about the mice, and they took at least 2 t/ha from this well-grown crop. Regardless, the April harvest yielded 11.80 t/ha of organic maize grain and we were all pleasantly surprised with the outcome.

Suffice to say, Ben is going to keep the formula going and aim to grow another circle of maize this summer.

Ryan Koschitzke from Elders with Ben, January 2021

November crop just after a cultivation

Seed Set at dry-down

Farmer maize demo at Boort, Vic by Scott Palmer (SLTEC)

Farmer: Steve Lanyon, Boort

Product: Corn Popup™ rate demo at 300 L/Ha, applied via furrow jets with 20 inch spacings

Sown: 20 Nov 2020 at 90,000 seeds/Ha, harvested 30 June 2021

Variety: PAC 440

Background:

Steve Lanyon has been trialling liquid pop up products on his farm for many seasons. Over that time, he has witnessed significant yield and vigour responses from the addition of SLTEC Corn starter products. Coming into the 2020 season SLTEC had discussed with Steve the possibilities of 'pushing the boundaries' on the starter concept to see how high a rate could apply to the seed to increase growth and yield responses without damage. Steve's standard application rate of popup fertiliser was 150 L/Ha, and the trial question was could this be doubled?

The demo was simple; the only variable would be the volume of SLTEC Corn Popup™ liquid injected in a side-by-side demo. The demo was sown with a Spot On AG™ precision planter in 60 metre strips.

Plots of Corn Popup™ at 150 L/Ha was compared against plots at 300 L/Ha. In the same paddock some nil and 60 L/Ha strips were also planted to exhibit at a proposed field day that unfortunately could not take place due to COVID-19.

Pre-plant fertiliser was drilled prior to planting (200 kg of MAP and 500 kg of Urea). Steve also applied two 200 L applications of SLTEC UAN via Y-Drops™.

SLTEC Fertilizers inspected and assessed trial progress every 2-3 weeks, taking hand cuts from 3 plants per treatment and measuring wet weight, height and visually recording the individual plants and their plots. Once cobs developed, they were weighed and photographed.

The first assessment was made on the 8 December 2020. The higher rates of Corn Popup™ consistently showed a trend towards more weight and early height compared the 150 L/Ha treatment.

On the 11 of January 2021, assessment of treatment wet weights showed the average weight of the 150 L/Ha plant was 716 g, whereas the 300 L/Ha treatment was 800 g per plant. This corresponds to a 12% increase in wet weight per plant or about 7,000 kg more growth per Ha.

Figure 2 (to the left) was taken on the 11 January (approximately 52 days after planting).

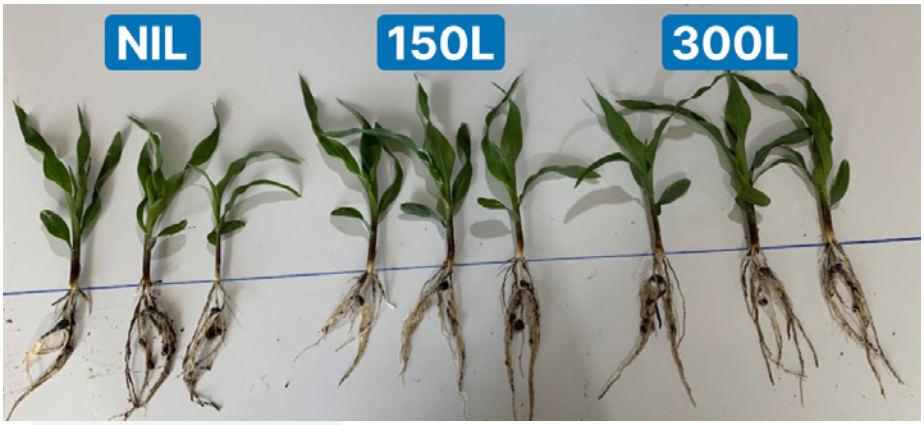


Figure 1. The 300 L rate (right) is more developed and has greater vigour than lower rates. Photo taken approximately 18 days after planting.

Figure 2. Wet weight assessments of Corn Popup treatments were taken on 11 January 2021 (52 days after planting). The 300 L/Ha treatment was 12% heavier than the 150 L/Ha treatment.

Cob weights showed similar trends, with cobs from treatment plots always heavier than the Nil and consistently larger (Figure 3).

Final harvest was not until the 30 June 2021 (Figure 4). Steve harvested the plots and the harvested grain was weighed in a stationary chaser bin with scales. The harvest results showed an impressive yield increase for the 300 L/Ha treatment (Table 1). Using a value of $300 per tonne for the grain, and a cost of $2 per L for Corn Popup™ (bulk pricing, delivered to farm), the extra return to Steve for increasing his rate to 300 L from 150 L/Ha would be approximately $600/Ha. This demo also showed that SLTEC Corn Popup™ is safe to apply at 300 L/Ha direct to the seed on 20 inch spacings using Furrow Jets™.

SLTEC Corn Popup™ is not just a liquid phosphorus product; it has been developed to optimise yield potential by improving maize seed germination, early vigour and root growth.

SLTEC Corn Popup™ has a balance of Phosphorus (11.1 %), Nitrogen (8.8 %), Zinc (1.9 %), Boron and Molybdenum. With a neutral pH and low salt index, it is an ideal liquid product for use at corn planting.

SLTEC Corn Popup™ is also compatible with other nutrients and stimulants, such as SLTEC's Bio Kelp 20™ and Tri -Culture™. SLTEC Tri-Culture ™ contains three forms of *Bacillus* to encourage root growth, allow for nutrient uptake and increase yield. In 2019 Steve also conducted trials with Tri-Culture™ which resulted in a yield increase of approximately 1T per Ha. The Tri-Culture™ demonstrations were replicated in 2020, however at the time of writing harvest results were not available.

Figure 3: Harvested cobs of Nil, 60, 150 and 300 L/Ha Corn Popup treatments on the 29 April 2021. All popup treatments showed consistently larger cobs. Final commercial harvest was not until the 30 June 2021.

Figure 4. The harvested plots at Boort, Vic. Photo taken 30 June 2021.

Corn Popup™ treatment	Harvested grain (tonnes/Ha)
150 L/Ha	13.34
300 L/Ha	16.00

Table 1. Grain harvested (tonnes/Ha) on 30 June 2021 from the treatment plots.

More information on the SLTEC products can be found on the SLTEC Fertilizers website.

Information for Spot On AG™ planters, furrow jets, and Y drops can be found on the Spot On Ag website.

SLTEC are members of the MAA and proud sponsors of the Australian maize yield competition.

Maximise Your Crop's Early Potential

FERTILIZERS

Corn Popup™

Product Code: SS9016

Corn Popup™ is a specifically designed product that is a combination of highly plant available orthophosphate, ammonium nitrogen, EDTA zinc chelate, molybdenum and boron.

Corn Popup™ is ideally suited to ensuring early and strong germination.

Benefits of Corn Popup™

- Readily crop available nutrients, suitable for immediate crop uptake.
- Balance of five essential nutrients to aid strong crop establishment and growth.
- Compatible with a range of agricultural chemicals and other fertilisers, allowing several application to take place in the single pass.
  *please consult with your SLTEC representative for further compatibility information

Guaranteed Analysis (w/v)

Nitrogen (N)	8.8%
N as ammonium	8.8%
Phosphorus (P)	11.1%
Zinc (Zn)	1.9%
Molybdenum (Mo)	0.004%
Boron (B)	0.04%
Specific Gravity	1.263 kg/L
pH Range	6.0 - 7.0

Typical Application Rates

Foliar:
Maize:
20 L/ha with water to 200 L/ha applied

Fertigation
Maize:
Up to 100 L/ha per application

Pop-Up, At Planting
Banded with Seed:
10 to 60 L/ha

Banded with Furrow Jets:
Up to 100 L/ha

Contact:
T: 1800 768 224
E: enquiries@sltec.com.au
W: sltec.com.au

Controlling Fall Armyworm: Trichogramma Parasitic Wasp in Maize by David Loxley, Bugs for Bugs

Natural enemies, either alone or combined with biopesticides can also be useful to reduce Fall Armyworm levels. *Trichogramma* wasps can be spread across the maize crop and have been found to successfully establish within a month to effectively control FAW.

A regenerative dairy farmer, Don Davis from the Darling Downs successfully released *Trichogramma* on his property last season. Although they did take a few weeks to establish and some maize stalks were devastated, the crop recovered fairly well and the *Trichogramma* appeared to have kept the FAW under control for the remainder of the season.

Egg raft parasitised by *Trichogramma pretiosum* Acknowledgement: Dr. Melina Miles, DAF Qld

FAW larvae newly emerged from egg raft Acknowledgment: Dr Melina Miles, DAF Qld

Fall Armyworm detected in Victoria: advice for monitoring and reporting by Jessica Lye, Cesar Australia

Since its detection in Northern Australia in early 2020 fall armyworm, *Spodoptera frugiperda*, has migrated to other regions and has now been detected as far south as Victoria.

Here we outline the current status of fall armyworm and how we can gain a better understanding of its potential range and impact in south-eastern Australia.

Prior detections of fall armyworm [H2]

Fall armyworm was first detected on the Australian mainland in February 2020 and soon after established in tropical and sub-tropical regions of Queensland, Northern Territory and Western Australia.

By late September 2020, the moth had spread to Northern NSW, first detected between Moree and Boggabilla. Increased surveillance through state department of agriculture trapping networks and reports from vigilant advisers and growers led to further detections throughout NSW.

Now fall armyworm moths and larvae have been found in all NSW key summer cropping regions including the Central West, Riverina, Murray, and South East. NSW DPI is working with growers to develop ongoing management strategies.

Detections and trapping in Victoria [H2]

A fall armyworm moth has recently been detected near Kotupuna in Northern Victoria through a PestFacts south-eastern pilot trapping program.

This detection comes after Victoria's first sightings in December 2020 with fall armyworm moths found in traps set-up in maize crops in Orbost, East Gippsland. Entomologists at Agriculture Victoria also report a further detection of fall armyworm moths near Bairnsdale in the same region.

In December, a pilot trapping program was established in Northern Victoria by our team to assess the type of by-catch (species other than fall armyworm) growers and advisers may trap when monitoring fall armyworm. We used two types of pheromone lures (ChemTica and Trece) in bucket traps.

The trapping program ran for 8 weeks with 2 traps at the crop boundary of 5 sites (Lockington, Corop, Kyabram, Kotupna and Shepparton). This resulted in the first detection in Northern Victoria from the site near Kotupna where a single male adult moth was found.

The findings of this pilot will be used to develop a grower guide for sorting trap catch and identifying suspect fall armyworm.

A seasonal presence in south-eastern Australia [H2]

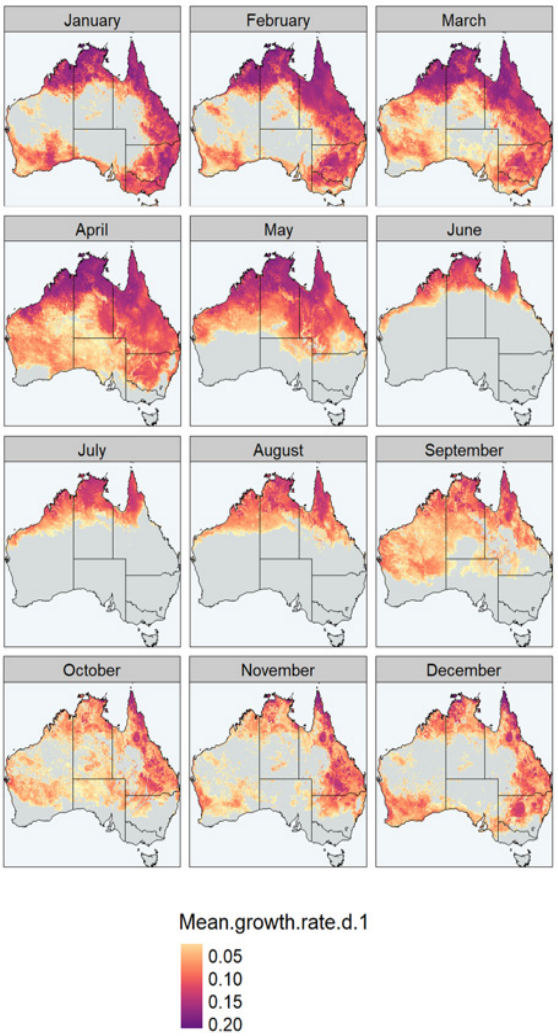
The fall armyworm is a sub-tropical/tropical species, so it is unlikely to be able to survive colder conditions in Victoria over winter. However, the adults have the ability to disperse, with populations recorded moving 2000 km/year, which means it is can migrate to more southern regions.

Recent predictive modelling work led by Dr James Maino at Cesar Australia provides key insights into the regions of Australia where permanent, year-round populations are likely to persist, and those regions which could support seasonal populations only.

As shown in the fall armyworm population growth potential maps, if fall armyworm moths migrate from more northern regions of Australia to the south-east, conditions from December to March can support fall armyworm population growth.

However, come April, conditions become less favourable for fall armyworm in much of south-eastern Australia and by May, even if fall armyworm are still present, their populations will likely no longer be able to grow.

One thing to note is that if condition are more mild than usual during late spring and autumn, it may extend the period of suitability in south-eastern Australia.



Monitoring is a must [H2]

There has been damage to maize crops in northern regions (see webinar from GRDC) but it remains to be seen how and if this species will impact crops in more temperate regions of Australia.

For the grains industry to develop an understanding of the spread and impact of fall armyworm in new regions grower and adviser reports and observations are crucial.

Current monitoring efforts use pheromone lures, which mimic the scent of the female in order to attract and trap the male moths. There are two lures currently available for use and permits are available via the APVMA.

In addition to lures, regular monitoring activities include inspections for both adults and larvae.

Eggs can be found on the underside of leaves but are difficult to distinguish from other lepidopteran species.

The larvae look similar to other armyworm species, but have more distinctive spots and a white 'Y' pattern on the head in later instars (similar to some other moth larvae).

The adults moths measure 3-4 cm from wingtip to wingtip and both sexes have a white hindwing with a dark-brown margin. The wings are mottled brown, with the male moths more patterned than the females, and have a triangular white spot at the tip and near the centre of each forewing which distinguishes them from other similar moths.

For more information on identification see the fall armyworm datasheet from CABI

A fall armyworm Continuity Plan has been developed to provide the grains industry with the most up to date information is available to facilitate a quick and flexible move to management.

How to report [H2]

While state governments will not attempt to eradicate this species, fall armyworm remains a notifiable pest in Victoria and NSW; it is important to remain vigilant in monitoring and to report any suspected sightings by:

- Calling the Exotic Plant Pest Hotline 1800 084 881 (All states) or
- Completing an online form (NSW or Victoria) or
- Emailing a photo to biosecurity@dpi.nsw.gov.au (NSW)

For more information [H3]

The Beatsheet - Fall armyworm (August 2020)

Fall armyworm - GRDC Grains Research Update, online

Acknowledgements [H3]

Thank you to the agronomists for helping source sites, and the growers who made trapping sites available.

Thanks also to Dr James Maino, Julia Severi and Dr Jessica Lye for assisting with the development of this article.

Figure 1: Fall armyworm male (Leo McGrane, Cesar Australia)

Figure 2: Trap used for Fall armyworm

Fall Armyworm – a new enemy for Australian maize growers by Stephen Sexton

Spodoptera frugiperda the Fall Armyworm (FAW) is so named because it invades the US and adjacent corn in Canada in late summer and early autumn each year from its base in southern Texas and the Caribbean. It has long been a major pest of corn, sorghum, millet and pasture grasses and is a late season pest of cotton in North, Central and South America. In late 2016, it entered Africa where maize is a key food staple and has rapidly become a threat to food security on that continent. Since that time, FAW has spread to the Indian subcontinent, South East Asia and China. It was first detected in northern Australia in February 2020 and by December 2020 had spread to Victoria and Tasmania.

Corn damage by Fall Armyworm

Eggs are laid in clusters with newly hatched larvae dispersing through the crop on wind-blown silk threads. Usually, only one larva per plant is found as they are cannibalistic.

When not eating each other, larvae are leaf feeders that are usually found deep within the corn whorl. This results in a series of holes and ragged edges on the expanding leaves. Damage to the growing point of the corn plant destroys growth potential. In the absence of control measures FAW can cause crop loss of between 20 and 80% in maize and total loss in corn.

Fall Armyworm larva

Large fall armyworm larva showing characteristic head markings

Generation time (egg-larva-pupa-adult-egg) can be as little as 30 days in summer. Adult moths are large with a wingspan of 32 to 40 mm. They are highly mobile and have been recorded flying more than 1500 kilometres in a night on favourable winds. Although not a major pest of sugar cane, this crop and a range of tropical grasses can provide a year-round reservoir for FAW when maize and sorghum are not available. Although the pest overwinters only in the tropics and subtropics, the entire continent of Australia is accessible when the weather in the south warms.

In South and Central America, insecticides have been used heavily for control of FAW. This has led to a number of problems:

- Larvae are not well controlled because they are largely inaccessible. Many receive low doses or are not contacted at all.
- Insecticide resistance to organophosphates, synthetic pyrethroids and some other common insecticide groups have become widespread and resistance has also been found in FAW in newly invaded countries
- Widespread use of cover sprays has led to destruction of natural enemies, exacerbating the problem.

Transgenic corn and cotton containing *Bacillus thuringiensis* toxin proteins have not proven very effective against this pest.

Strategies with promise for control of FAW.

Female Fall Armyworm – just 50 females/ha can cause significant commercial injury

Push-Pull in Africa.
Smallholders plant a repellent understory legume (Desmodium spp.) within the crop. Around the perimeter of the field, they plant Mulato II, a tall fast-growing grass that is highly attractive to the moths. They lay eggs on the Mulato grass but the larvae cannot survive to maturity. This strategy is effective and conserves natural enemies but is unlikely to be attractive for large scale maize growers in Australia.

Attract and Kill in Australia
Another strategy is to target the adult moths entering the crop with an attractant/feeding stimulant. A well fed female FAW can lay more than 2000 eggs in a lifetime - about 250 eggs per day for 8 days. It takes only about 50 female FAW moths per hectare to cause significant commercial loss so killing this stage can have a major impact. An effective attract and kill product for adults takes advantage of the high mobility of FAW. Moths such as FAW fly hundreds of kilometres and have a powerful drive to find energy in the form of sugars. Once fed, the ovaries of the immigrants mature and they lay eggs. The best source of sugar in nature is floral nectar and flowers release perfumes to attract sugar feeding insects.

Sinogreen, a company based in Nanjing in China has developed QM FAW which is being further developed and marketed in Australia by Agreva, an Australian family-owned business. QM FAW is a super-charged floral

attractant and feeding stimulant designed to attract FAW. It is a thick white liquid which is diluted 1:1 with water. Growers combine this with a small amount of a registered insecticide and apply it as a concentrated squirt either aerially or from a simple ground rig on a 4-wheel motorbike. Treatment around the field perimeters and a single row every 50 to 100m within the crop is normal. Typically 500 ml to 1 litre of QM FAW concentrate per 100 metres of row is used. Both male and female moths fly to the QM FAW bait, feed and die.

This strategy has a number of advantages;

1. It targets both male and female FAW moths entering the crop as well as those already in there.
2. Only a small percentage of the insecticide required for a cover spray is needed.
3. Insecticides may be rotated to overcome resistance.
4. Unlike cover sprays, QM FAW has minimal effect on natural enemies which target eggs and larvae.
5. Compared with cover sprays, application of QM FAW is very fast and easy.
6. QM FAW can be accurately timed using pheromone traps which warn of the beginning of FAW flight
7. QM FAW will attract the adults of certain other significant pests including *Helicoverpa armigera*

Female FAW feeding on QM FAW

agreva Sustainable Agriculture

Product enquiries: **Danny Thornton, Agreva**, on 0400 559 357 or dthornton@agreva.com.au

About the author: Stephen Sexton is an Australian entomologist based in Nanjing in China and has been the principal scientist of Sinogreen Biotech for the past seven years. He developed the QM FAW product in 2019 and 2020 to provide an effective tool for farmers to manage fall armyworm.

Biosecurity advisory notice: Fall armyworm detected in Tasmania

A single, adult fall armyworm (FAW, ***Spodoptera frugiperda***) was recently detected in a surveillance trap near Wynyard in north-western Tasmania.

FAW is an invasive tropical and subtropical pest native to the American tropics.It has rapidly spread across Australia following initial detections and establishment in the north of the country.

It was first detected in far north Queensland in January 2020 and was subsequently detected in northern Western Australia and the Northern Territory before making its way south into New South Wales later in 2020, before being detected in Victoria in December 2020.

It would be possible for FAW to migrate to Tasmania from warmer areas during the warmer months due to its ability to disperse long distances on wind currents. However, due to its preference for warmer climates it is unlikely to thrive or establish permanent populations in the cool temperate Tasmanian climate.

Biosecurity Tasmania (BT) is encouraging growers and members of the public to help detect FAW by submitting suspect specimens to Plant Diagnostic Services.

BT will identify suspected FAW specimens at no cost. Visit the FAW webpage for further information including instructions on how to submit a sample.

MAA Executive

The executive of the Maize Association of Australia is elected by the Association's members to represent the maize industry and work on its behalf:

- To identify new opportunities for growers and marketers;
- To respond to issues affecting the industry, e.g. GMO and export standards; and to
- Liaise with R&D corporations to achieve the best outcomes from growers' R&D levies.

The table below lists the members of the current executive, along with their contact details. If you know of an issue about which the maize industry should be aware, or an issue on which the maize industry should develop a position, or could assist with the advancement of, please contact an executive member to discuss your thoughts.

MAA Executive Committee 2019-2020

AME	COMPANY	MOBILE:	EMAIL:
Stephen Wilson (Chair)	GenTech Seeds Pty Ltd.	0428 351 196	Stephen.wilson@gentechseeds.com
Liz Mann (EO)	CEO MAA	0427 857 578	lizmann.ag@gmail.com
Andrew Cogswell	Lachlan Commodities	0417 512 003	andrew@lachlancommodities.com
John Auer	HSR Pty. Ltd.	0448 580 237	john.a@hsrseeds.com
Jason Scott	GenTech Seeds Pty Ltd.	0447 717 020	Jason.scott@gentechseeds.com
Karl Schilg	Advanta Seeds	0488 049 160	karl.schilg@advantaseeds.com
Luke Mancini	Yenda Prods Grain	0437 512 322	lmancini@ypgrain.com.au
Johannes Roellgen	Grower	0437 512 322	johannes.roellgen@bigpond.com
Chris Salafia	Grower	0427 695 675	salafiafarm@bigpond.com
Gino De Stefani	Grower	0447 717 020	ginodestefani@hotmail.com
Ian Hamono	Grower	0427 572 388	hamilys@bigpond.com
Scott Palmer	Grower - Agronomist	0455 400 514	Scott.Palmer@sltec.com.au

The Maize Association of Australia will be undertaking a number of activities in Northern Victoria and Southern NSW over the coming season.

All members of the MAA will be invited to participate in events. If you would like to receive the field days notices or the COB please forward your email address to Liz Mann (lizmann.ag@gmail.com) or phone 0427 857 578

If you are not currently a member, but would like to join, the cost of membership (inc. GST) is:

Corporate member	**$1,500/year**
Merchant company member	**$750/year**
Research corporation member	**$220/year**
Individual producer member	**No Cost**

Maize Association of Australia Incorporated ABN 1650 790 2551

Membership Application 2020/21 for membership based on the financial year ending June 30, 2021 Please accept my/our application for membership of the Maize Association of Australia (tick relevant box)

☐ Corporate members	$1,500.00 per year
☐ Merchant company members	$750 per year
☐ Research corporation members	$220.00 per year
☐ Individual/producer members	No cost

Please make your cheque payable to Maize Association of Australia Membership fees inclusive of GST

Name.....

Company/Organisation.....

Address.....

.....

Town/City.....State.....Postcode.....

Telephone.....Fax.....

Email.....

Please cut out this form and return it with your cheque to:
Maize Association of Australia,
534 Craven Rd
Tatura, Vic 3616

The MAA will issue you with a tax invoice on receipt of your membership application and payment.

Direct Credit

Please enter your name and invoice number when paying by direct credit

Account name:	Maize Association of Australia
BSB:	032 750
Bank:	Westpac
Account:	25 7709
Branch:	Banna Ave, Griffith

If you would like to receive the COB and be on the MAA mailing list, please send an email to lizmann.ag@gmail.com

Thank you for supporting the MAA - YOUR industry association
www.maizeaustralia.com.au